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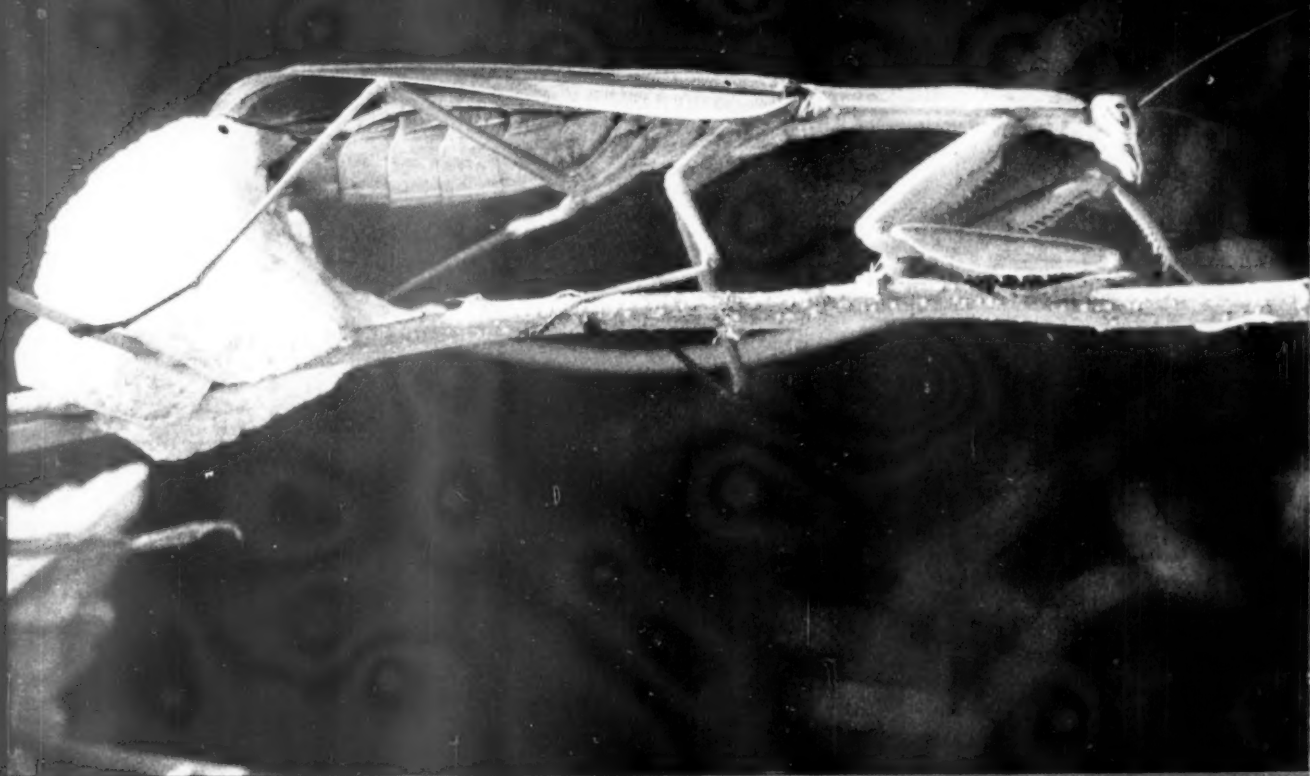
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May 10, 1958

VOL. 73 NO. 19 PAGES 289-304

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Mantis

See Page 302

A SCIENCE SERVICE PUBLICATION

Virology

Virus Study Advances

► A THEORY on the role played by a virus after it enters a host cell has been offered.

When viruses are outside of cells they are separate, tiny particles with identifiable forms and chemical composition. Many are composed merely of protein and nucleic acid. They are biologically inactive and cannot reproduce themselves in this state.

Upon entering a host cell, however, the virus particle disintegrates and disappears. The nucleic acid of the virus is released and directs the production of new virus materials in the host cell. This is the theory of virus attack as presented to the American Philosophical Society meeting in Philadelphia by Dr. Frank L. Horsfall Jr. of the Rockefeller Institute for Medical Research, New York.

The ultimate goal of the virus particle is to accomplish the safe conduct of the nucleic acid into a host cell which can support multiplication of the virus.

The shell of the virus itself is not essential, however, because naked nucleic acid

removed from the virus particle can itself lead a cell to produce new particles, Dr. Horsfall said.

The actual reproduction of more virus particles in the host cell proceeds in sequential steps at a molecular level. The last step is the assembly of a new virus particle from its component parts.

Damage to the host cell is a coincidental result of this process and may be severe enough to destroy the host.

To date, scientists have been able, in some cases, to prevent virus penetration into a host cell by using antibiotics.

However, they have not been able to prevent reproduction after the nucleic acid has made its entrance into the cell. A few chemical compounds are known to accomplish this feat, Dr. Horsfall said, but they also inflict damage upon the host cells.

Scientists are now studying methods of controlling virus reproduction after the nucleic acid has entered the host cell in the hope that such reproduction can be inhibited.

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Medicine

New Lobotomy Used

► INJECTION of very hot water, 167 degrees Fahrenheit, directly into the frontal lobes of the brain is a new treatment for mentally disturbed patients.

Developed by Dr. Rudolph Jaeger, professor of neurological surgery at Jefferson Medical College, Philadelphia, the treatment was given to 65 patients suffering from anxiety states caused by the unbearable pain of cancer, emotional instability, cerebral thrombosis, paresis, senile psychoses, schizophrenia, atypical face pains and the widespread pains of simple hypochondriasis.

To give the treatment, a little hole is first made through the skull at each temple. The blood vessels of the underlying brain surface are treated by electrocoagulation to prevent bleeding. After the skin wound is sewed up, a blunt needle is inserted through the skin between the stitches to the frontal lobes of the brain. The usual amount of hot water injected is a little less than a teaspoonful, from three to four cubic centimeters, but the quantity can vary.

Later, similar treatments may be given without the need for any further operation; the hot water can be injected at any time through the openings in the skull that are already made. Usually a second injection follows the first one after about two weeks.

A third, fourth or even fifth injection may be needed at intervals of weeks or months, depending on the severity of the patient's symptoms.

The hot water injection severs the connections between the frontal lobes and other parts of the brain. The effect is thus similar to that of surgical lobotomy.

But the advantage of hot water lobotomy, Dr. Jaeger reports, is that it is possible to start with a small area and gradually extend the lobotomy effect as may be needed over an indefinite period of time without any additional operation.

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General Science

Seven Experts Awarded Medals by NAS

► SEVEN PRIZED science medals were awarded by the National Academy of Sciences on April 28.

Two astronomers were honored: Dr. Horace W. Babcock, Mt. Wilson and Palomar Observatories, the Henry Draper Medal for work leading to the discovery of magnetic fields in star and sun, and Dr. George Van Biesbroeck of Yerkes Observatory, the James Craig Watson medal for measurements of double stars, comets and satellites.

Dr. Ernest W. Goodpasture of the Armed Forces Institute of Pathology received the Jessie Stevenson Kovalenko medal for achievements in pathology, including the use of the chick embryo for propagating viruses for preparation of immunizing vaccines.

For studies in heredity and the process of biological evolution, Dr. Theodosius Dobzhansky of Columbia University received the Kimber Genetics Award.

Measurement of the ages of meteorites won the J. Lawrence Smith medal for Dr. Mark G. Inghram of the University of Chicago.

Fossil studies were recognized by two medals, the Mary Clark Thompson medal to Dr. Gustav Arthur Cooper of the United States National Museum who worked on brachiopods and the Charles Doolittle Walcott medal to Dr. Pierre Hupe of the Sorbonne who investigated trilobite deposits.

Dr. Henry Allen Moe, secretary-general of the John Simon Guggenheim Memorial Foundation, received the Public Welfare Medal of the National Academy. This is awarded for "eminence in the application of science to the public welfare."

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Pediatrics

Do Not Change Child's Diet During Summer

► A NEW HOT weather syndrome will hit millions of children this summer.

This syndrome is characterized by a pale, flabby, tired child who has gained excessive weight during the warm weather because he stays inside an air-conditioned house, watches television, and munches on snacks which destroy his appetite for well-balanced meals.

Hot weather imposes no special dietary requirements for children. Extra water is the only addition they need during the summer months, Drs. Floyd A. Norman and Edward L. Pratt, Dallas, Tex., pediatricians, report in the *Journal of the American Medical Association* (April 26).

Children do not need an extra supply of salt, as do some adults, they stressed. It is unwise for adults to condition children to dislike hot weather or subject them to summertime food fads.

The doctors' rules for maintaining good nutrition and eating habits among children include:

Vigorous outdoor activity. Children do not mind hot weather unless they are conditioned to dislike it.

Cool, not cold, drinks are best. Water should be used to quench the thirst whenever possible; between-meal foods and high-caloric drinks should be limited.

Plan "cooling-off" periods which will quiet the child before mealtime and may increase the appetite.

Limit high-caloric foods such as ice cream and peanut butter, and serve the main meal at night when the temperature is lower.

If infants and children eating well-balanced diets do not tolerate ordinary heat, they should be examined for illness rather than switched to another diet, they conclude.

Both doctors are affiliated with the department of pediatrics, University of Texas Southwestern Medical School, the Children's Medical Center, and Parkland Memorial Hospital, Dallas.

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The European corn borer in 1957 destroyed almost 181,000,000 bushels of corn grown for grain, worth \$168,841,000.

When Korean rice paddies are flooded, carp fish are introduced and grow to edible size before the rice is harvested.

GEOPHYSICS

First U.S. "Moon" Report

A mysterious radiation has been discovered through the scientific probings of Explorers I and III along with important findings in space temperature and atmosphere density.

► THE FIRST reports on findings from the first two U. S. satellites have been announced by scientists of the International Geophysical Year program. They included:

A mysterious radiation so powerful it blanked the cosmic ray recorders was discovered at heights greater than 660 miles above the earth's surface. Source of this radiation is unknown, but its intensity is such that human beings would be exposed to the highest permissible weekly dose within five hours.

Adequate temperature control for sensitive instruments inside a satellite can easily be obtained by coating the vehicle with strips of a heat-radiating chemical. Success of this technique indicates temperatures inside larger satellites, such as those containing humans, could readily be kept within livable limits.

The number of micrometeorites, tiny dust-like particles in space, is about as expected. Only seven particles were detected by the microphone, and after 32 days not more than one of the tiny gauges registered the direct impact of a micrometeorite. The average number of particles ten microns (one micron is one-thousandth of a millimeter) or more in diameter in the vicinity

of earth during a 32-day period is not more than one over each 3,300 square feet every second. Particles four microns or larger were measured at the rate of one per 330 square feet each second.

The atmosphere at a height of 220 miles has a density of about two ounces per cubic mile. This is about 14 times the density of about one-seventh of an ounce per cubic mile that had been predicted at such altitudes in pre-satellite days.

The probable lifetime of Explorer I is about five years, compared with 92 days for Sputnik I and some five months for Sputnik II.

These and other details concerning the scientific space probings of Explorers I and III, officially known as 1958 alpha and gamma, were reported to a special joint meeting at the National Academy of Sciences and the American Physical Society in Washington.

The report on cosmic rays was made by Dr. James A. Van Allen for his group at the State University of Iowa; on satellite temperatures by Dr. A. R. Hibbs of California Institute of Technology's Jet Propulsion Laboratory; on micrometeorites by Dr. Edward Manning of the Geophysics Re-

search Directorate, Air Force Cambridge Research Center; on orbital calculations by Drs. Joseph W. Siny of the Naval Research Laboratory and G. F. Schilling of the Smithsonian Astrophysical Observatory, Cambridge, Mass. Dr. Schilling's report was based on orbital studies made by Dr. Charles A. Whitney and Dr. Theodore E. Sterne, also of the Smithsonian.

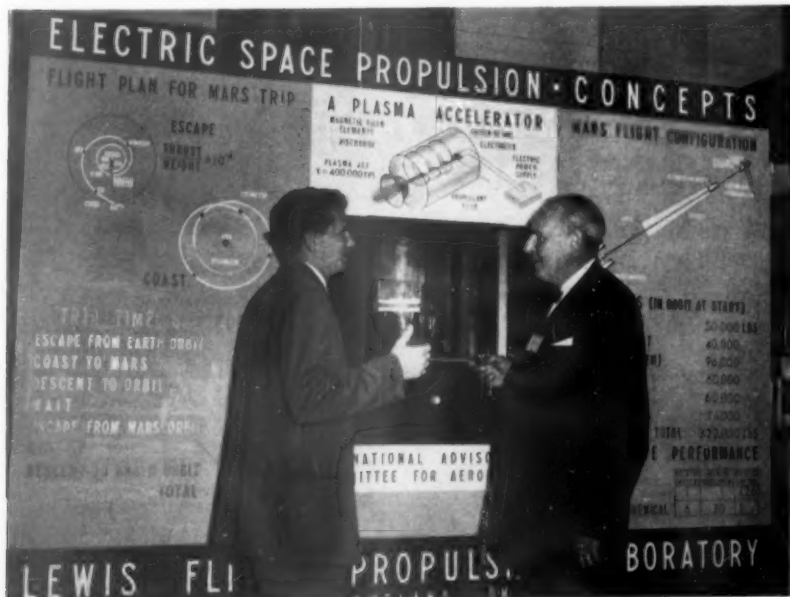
Dr. Van Allen and his colleagues at the State University of Iowa calculate that if the satellite's cosmic ray geiger tube had not been jammed by an intense radiation field, it would have registered at least 35,000 counts per second. They believe this radiation is closely related to the soft radiation previously detected during rocket flights in the auroral zone.

The radiation intensity necessary to blank the geiger tube is equivalent to 60 milliroentgens an hour, or three-tenths of a roentgen in five hours or less. The recommended permissible dose for humans is three-tenths of a roentgen per week. The roentgen is a unit for measuring radiation.

The energy of this radiation, they suggest, may contribute significantly to the heating of the high atmosphere. The particles causing it are believed to be initially associated with huge masses of ionized gas encountered by the earth in its journey through space.

Drs. Fred L. Whipple and J. Allen Hynek, respectively director and associate director of the Smithsonian Astrophysical Observatory, pointed out that since Oct. 4, 1957, eight objects have been sent into earth-circling orbits. Only the efforts of thousands of persons made possible tracking of all of them.

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ACADEMY EXHIBIT—Stanley Domitz of the National Advisory Committee for Aeronautics, and Dr. Lloyd V. Berkner, president of Associated Universities, Inc., and a member of the U. S. National Committee for IGY, discuss an exhibit on space propulsion at the National Academy of Sciences meeting in Washington, D. C. (See pp. 293-95 and 297.)

GEOPHYSICS

Satellite "Bubble" Test-Launched

► A 12-FOOT "bubble" of air such as will be put into an earth-circling orbit from an Explorer satellite was successfully test-launched to a height of 50 miles by the National Advisory Committee for Aeronautics.

Dr. Hugh L. Dryden, NACA director, reported the devices to open and inflate a nine-pound package to a 12-foot balloon worked successfully. He told a joint meeting of the American Physical Society and the National Association of Science Writers the balloon was tracked by radar for more than an hour, then it was whisked away over the ocean by the jet stream.

The sub-satellite was carried to the 50-mile height above Wallops Island, Va., by a four-stage solid propellant rocket on April 25. Then the plastic balloon was inflated with air to iron out the wrinkles in its skin, which has a very thin coat of aluminum foil. The air is then released so the balloon will not be punctured.

Dr. Dryden said the NACA was also planning to build an aluminum-coated plastic bubble that would be 100 feet in diameter when inflated. Such a large, inert satellite, he said, would be very useful for studying the possibilities of satellites as communications stations, and it would also be easily visible to the naked eye.

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PUBLIC HEALTH

Poison Fish Menace Health

Identifying poisonous fishes and taking precautions against poisoning by the fishes that are taken for food present problems for the public health official.

► RECENT MASS poisonings affecting some 40,000 persons in the western Pacific area, mostly Japan, the Philippines, and Viet Nam, point an incriminating finger at the fishes.

The large numbers of persons affected in a five-year period also indicate the public health significance of poisonous fishes, Dr. Bruce W. Halstead warns in *Public Health Reports* (April).

Poisonous fishes can be described as mostly tropical, commonly found near islands and in lagoons rather than in the deep sea or along continental shores.

So far scientists have little factual information on just what makes some species of fish poisonous, how to detect an edible fish from a poisonous one, or exactly how great a toll of human lives is taken. Apparently toxicity is not "species specific," except possibly for the puffers. In one species, fish may be toxic in one place and edible in another place. In some species large individuals are more likely to be poisonous than smaller fishes.

Neither spoiling nor bacteria, except with tuna and some related fishes, seem to influence the origin of the toxin, Dr. Halstead reports.

Scientists now believe that most of the poisons come from the food eaten by the fishes. Stomach content analyses show algae are more often found in poisonous fishes than any other food. Also toxicological

tests of these algae found along shores show some contain poisons. Bacteria do seem to play a part in forming a toxin in the tuna, however.

Symptoms of fish poisoning range all the way from a "gastrointestinal upset," nausea, diarrhea and vomiting to violent convulsions, paralysis and other "violent neurotoxic symptoms." With some fishes, Dr. Halstead notes, the case fatality rate is as high as 60%.

Dr. Halstead advises that the viscera—liver and intestines—of tropical marine fishes never be eaten. Roe is also potentially dangerous, producing rapid death in some cases. Unusually large groupers, barracudas and jacks should not be eaten during their reproductive season.

If questionable fishes must be eaten in order to survive, Dr. Halstead recommends cutting the flesh into small bits and soaking the pieces in several changes of water. This, he says, leaches out the poisons which are water-soluble. Ordinary cooking alone does not make the fish less poisonous.

Dr. Halstead, chairman of the section of natural products, School of Tropical and Preventive Medicine of the College of Medical Evangelists, Loma Linda, Calif., is currently on military leave with the division of preventive medicine, Naval Medical School, National Naval Medical Center, Bethesda, Md.

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mands that we give increased attention to better street lighting.

Mr. Karns reported modern fluorescent tubes coupled with optical lenses can more than double the coefficient of utilization of the light available from existing fluorescent systems.

In such a system reflectors direct the light out and across the streets while lenses direct the light up and down the street.

Mercury lamps provide a source of light two to three times as efficient as incandescent lamps and last three to five times as long, he said.

Replacement of mercury lamps needs to be done only about every two years and cleaning costs can be cut considerably by having the optical system sealed.

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ENGINEERING

Street Lights Inadequate

The use of fluorescent lights or mercury-vapor lamps could help correct a situation in which some 90% of the nation's streets are inadequately lighted.

► NINETY PERCENT of the nation's streets are poorly lighted in an age when modern improvements make it possible to provide good lighting for 100% of our streets.

The same developments that will provide good street lighting also will save cities money in the long run, scientists at a regional meeting of the American Institute of Electrical Engineers in Washington, D.C., were told.

Incandescent lamps, or light bulbs, now used for most street lighting should be replaced by more efficient and longer-lasting fluorescent or mercury-vapor lamps, E. B. Karns, Westinghouse Electric Corporation, Cleveland, said.

Some engineers believe even less than 10%

of America's streets are well-lighted. John W. Young, Natwick, Mass., lighting consultant, told the same meeting that "of a total of 372,000 miles of urban roadways, only 7.2% is lighted to the minimum standards."

The remaining streets vary, with many "classed as passable but with lighting inadequacy as gauged by present day recommended practice," he said, adding that even the good lighting of major streets and freeways "increases the urban percentage only slightly."

Our change of habits toward more "night-time living," brought about by the social and economic changes of shopping and entertainment centers and public gatherings, de-

PHYSIOLOGY

Detect Visual Pigments

A new technique for examining visual pigments in the living eye has helped to explain further the type of color blindness in which red and green are indistinguishable.

▶ AN INDIRECT way of detecting the visual pigments in the intact eye of a living, seeing human individual was described to the National Academy of Sciences meeting in Washington, D. C., by Dr. W. A. H. Rushton of Cambridge University, England.

Every motorist is familiar with the way the light of his headlights is reflected by the glowing eyes of a cat or of a wild animal along the roadside at night. Although the human eye does not reflect light as well as does the cat's eye, the same principle made possible a study of the visual pigments in the human eye.

The eye has two kinds of visual receptors, rods and cones. The rods are used in twilight or night vision and are predominant in the eyes of nocturnal creatures. The cones, which are used in day vision, are found in the eyes of creatures that roost or go to sleep at night. Thus, the rods are used mostly by owls, the cones by fowls, Dr. Rushton explained. Only the cones have color vision.

The visual pigment that has been found in the rods of the eye is rhodopsin.

Examination of the eyes of chicks showed the cones have another pigment known as iodopsin. The chick's eye has ten cones to one rod, but it has twice as much rhodopsin as iodopsin.

Examination of cones of the human eye

usually has failed to reveal the presence of any iodopsin or any other visual pigment. But by shining a colored light into the living eye to bleach out the iodopsin, information about the presence of the pigment was revealed.

Tests on color-blind persons of the type known as "protanopes," who confuse red and green, were particularly interesting when compared with tests on the normal eye. The protanope sees no difference between red and green light. And when a light which would bleach out red and another which would bleach out green were shone into the protanope's eye, the same result was obtained, indicating that there is only one pigment in this colorblind eye.

When the same test was applied to the normal eye, it was found that it has two visual pigments. One pigment is bleached out by a deep red light and the other is the same as that in the protanope's eye.

Dr. Rushton used his own eye as the normal eye.

In the red-green confused protanopes, Dr. Rushton concluded, the red pigment is replaced by green. Thus, although they see either red light or green light as being green, they are completely unable to see red.

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tool because Neanderthal Man did not have any better kind of surgical knife.

The Neanderthal skeleton was found in the Shanidar Cave by Dr. Ralph Solecki, also of the Smithsonian. Dr. Stewart went to Iraq to study the bones under a grant from the American Philosophical Society.

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SURGERY CASE—The amputated right arm of a Shanidar Man appears next to the normal arm (right).

MANPOWER

America Said in Need of More Women Physicists

▶ THE UNITED States should train more women physicists, according to Dr. Janet Ramage, an attractive blue-eyed blonde who is the first woman physics instructor at the University of California at Los Angeles.

A native of the Isle of Wight, Dr. Ramage studied at the University of London and joined the UCLA faculty this year.

"Both American industry and the teaching profession could use many more women physicists," she says. "It is a wide open field for any coed with a liking for science and mathematics."

She points out that in European countries, and even some Asiatic countries, girls are proportionately more numerous in science classes than in the United States.

What accounts for this poor representation of women students in the most scientifically advanced country in the world?

"American girls get too little science in high school, and by the time they enter college they are frightened of the subject," says Dr. Ramage. "I have studied nothing but science since I was sixteen years old—and got over my fright early."

She adds that not only must girls get over their fright of science, "but also of boys' fright of girls who study science."

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ANTHROPOLOGY

Find First Surgery Case

Discovery of a 45,000-year-old skeleton of a Neanderthal may have brought the earliest known example of amputation to the attention of anthropologists.

▶ WHAT MAY very well be the earliest known example of surgery was reported to the American Philosophical Society meeting in Philadelphia by Dr. T. D. Stewart, Smithsonian Institution physical anthropologist.

The 45,000-year-old skeleton of a Neanderthal found in remote Shanidar Cave in northern Iraq had its right arm amputated just above the elbow.

This ancient primitive "uncle" of modern man had had an injury to the right arm before the amputation. It may have been a birth injury. Whatever it was, the arm bone and also the collar bone and shoulder blade were atrophied. The arm bone went on growing to a normal length but in thickness it was only the size of a little finger.

After consultation with orthopedic surgeons, Dr. Stewart concluded that the origi-

inal trouble looked like what is now called Erb's paralysis, a form of birth injury. There is a possibility it may have been caused by polio.

The birth injury must have caused the paralysis. Then at around puberty or young manhood, the useless arm was again injured, this time fracturing the bone just above the elbow. The Neanderthal was at least 40 when he was killed by a rockfall in the cave.

The forearm must have dangled, useless and in the way. It is quite possible that Shanidar Man, or one of his fellows, may have intentionally cut it off just as a dog or other animal will sometimes chew off a dangling, useless paw.

If this is, indeed, the first known case of surgical amputation, the operation must have been performed with a chipped stone

TECHNOLOGY

Sound Guards Secrets

► TOP SECRET documents now can be left lying on desks overnight or can be stored regularly in open racks without posting a human guard in the room, thanks to a new electronic device the size of half a grapefruit.

The device greatly reduces the number of human guards needed at maximum security installations. It cannot be attacked and overcome by intruders.

The electronic guard is a ceiling-mounted ultrasonic transmitter that floods a restricted area with sound waves of 19,200 cycles per second, beyond the range of human ears, and sounds an alarm when there is the slightest movement in the protected area.

The equipment, said to be tamper-proof, was developed by Walter Kidde and Company, Inc., Belleville, N. J., engineers to meet the unusual security needs of a West Coast defense contractor.

System Development Corporation, Santa Monica, Calif., conducts the system training program of the Air Defense Command and assists with high-speed computer programming of the new SAGE (Semi-Automatic Ground Environment) system of air defense.

System Development's scientists and mathematicians must have their classified papers, maps and films as readily available "as text books are to a high school student," security chief Robert Dennis said, even though 1,200 employees enter and leave the building daily.

"For convenience and practical efficiency of operation," he said, "it is necessary that much of this material be stored in open racks and in some cases left in project rooms overnight."

Ultrasonic intruder detection alarm systems have been installed in the top secret document control room, the library's classified repository, the war gaming room and two basement areas where classified material is assembled and stored.

Whenever one of the rooms is vacated, its door is locked and the Kidde detector turned on. If anyone should enter the room, his movements alter the frequency and cause alarms to sound at the central guard station, where a control panel indicates the room "invaded." Guards immediately converge on the room.

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enable engineers to eliminate some of the enormous safety expenses without sacrificing operational safety, D. Kallman, Babcock & Wilcox Co., and O. G. Hanson, Consolidated Edison Co., New York, predicted.

In the meantime, they said, engineers will continue to plan reactor safety conservatively, even though many feel some of the precautions are not needed.

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PHYSIOLOGY

Severe Stress Caused Heart Change

► CONSIDERABLE damage occurred to the heart muscle of animals subjected to severe stress, a research team has reported.

Repeated stimulation caused a significant increase in the weight of the heart, a rise in the fat content, and reduction in the essential metabolites and carbohydrates.

Fifteen male rats were placed in individual cages in a small dark room where, at irregular intervals and for a total of several hours daily, they were subjected to light flashes of high intensity. In addition, an electric vibrator produced highly intense sounds.

During a five-week period the rats consumed daily a quantity of food almost equal to that consumed by a control group. At the end of the five-week period, both the experimental and control groups were killed. Their hearts were examined and compared. The results demonstrate the effect of repeated stimulation, the scientists say.

It is well known that psychological factors affect the normal cardiac function of humans. Some scientists attribute many of the cardiovascular diseases to this very reaction to stress. E. Mascitelli-Coriandoli, R. Boldrini and C. Citterio of the research department of Farmavigor, S.p.A., Milan, Italy, report their results in *Nature* (April 26).

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FOREST PATHOLOGY

Anti-Enzyme May Aid Elm

► AN ANTI-ENZYME weapon to control Dutch elm disease may result from findings reported to the National Academy of Sciences meeting in Washington, D. C.

How the fungus responsible for the fatal tree disease makes enzymes that help it perform its murderous work has been found, Drs. A. E. Dimond and Ahktar Husain of the Connecticut Agricultural Experiment Station, New Haven, Conn., reported.

"It may be a long time before this research finds practical use in control of Dutch elm disease," Dr. Dimond said.

"If these enzymes are very important in helping the fungus to find its food in the tree, then we may be able to find chemicals to inactivate them. To be practically useful, such anti-enzymes will have to be absorbed by the plant and moved into the water-conducting system in sufficient concentration to do the job. Luck is with us because so very little of the enzyme is present, and it will not take very much of the compound—when we find it."

Two enzymes are formed by the fungus that help it attack a tree.

One attacks the cementing substance in the stem, the pectins familiar to the housewife when she makes jelly. The other attacks cellulose wood substance.

Produced in small amounts, the enzymes break down tree components into harmless sugar-like compounds that serve as foods for the fungus.

While this is taking place, the pectic enzyme performs another chore for the fungus by creating dams within the tree to slow down the water supply from roots to leaves.

The two enzymes, in effect, keep the fungus well-fed and the tree starved.

Dr. Dimond said that these recent findings are part of a long program to find an inexpensive and effective means for combating Dutch elm disease.

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ENGINEERING

Safety Measures Are Big Power Reactor Expense

► NUCLEAR reactors designed to produce electrical power probably are safer than necessary because engineers do not want to risk human life and health.

As much as \$6,000,000 may be spent just on the safety features of large nuclear power reactors now being built or in the design stage, scientists learned at a regional meeting of the American Institute of Electrical Engineers in Washington, D. C.

The two major types of safety features are "operational safety provisions" and "special safety precautions." The latter are designed for the absolute prevention of unexpected accidents.

Experimental data now being collected through operation of existing reactors may

GERIATRICS

Aging in Human Beings Gets New Research Grant

► A CONCERTED attack on the problem of aging in human beings is being launched with U. S. Public Health Service-National Institutes of Health grants of \$1,510,000 over five years given to the Albert Einstein College of Medicine at Yeshiva University.

"The health and medical aspects of old age have received less intensive study than the economic and social aspects," Surgeon General Leroy E. Burney of the U. S. Public Health Service said in announcing the grants.

Research on the aging process in the circulatory, nervous and respiratory systems will be conducted by a dozen senior investigators backed up by post-doctoral fellows and other personnel. A 90-bed section of Bronx Municipal Hospital will be used for clinical research and teaching.

The program supplements research in the seven institutes of the NIH and 120 research projects on gerontology supported by annual grants totaling over \$2,000,000.

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PHYSICS

Neutrinos "Explain" Gravity

A new theory, based on study of the neutrino, that may reconcile the differences in various descriptions of the forces of gravitation has been proposed.

► A NEW THEORY describing the forces of gravitation in a manner entirely different from that used by the late Albert Einstein, was reported to the National Academy of Sciences meeting in Washington, D. C.

Dr. Leonard I. Schiff of Stanford University has devised a way to account for gravitation by assuming that it comes from the exchange of neutrinos between any kinds of matter. Neutrinos are nature's "ghost" particles, having no electric charge and virtually zero mass.

Dr. Schiff's studies, still in their preliminary stages, are aimed at finding an approach other than Einstein's general theory of relativity to explain gravitation. Einstein's theory is successful in accounting for the five known experimental tests, but breaking it down into distinct units, or "quantizing" it, is extremely difficult.

Because of this, Einstein's theory stands apart from quantum theory, which very successfully accounts for events on the atomic and nuclear scale. For many years, scientists have suggested that gravitational force might resemble electromagnetic or nuclear forces in that the last two arise from the exchange of some kind of particle between the interacting objects.

Electromagnetic forces arise from the interchange of light quanta, or photons, between electrons or protons, and nuclear forces arise from the interchange of pi mesons between neutrons or protons.

Previously, the idea that gravitational forces could arise from interchange of neutrinos between any kinds of matter could not be made consistent with a very precise experiment performed by the Hungarian physicist Eötvös in 1910. This experiment showed the gravitational weight of any object and its inertial mass are strictly proportional to each other to an accuracy of one part in 100,000,000.

Dr. Schiff has found a way to account for this experimental fact by modifying the neutrino theory in a particular way. His theory not only accounts for the Eötvös experiment, but for Newton's inverse square law of attraction and for the red shift of light originating in a strong gravitational field.

The other two experiments successfully predicted by the Einstein theory so far are not accurately predicted by Dr. Schiff's theory. These two are the deflection of light passing through a strong gravitational field (the "bending" of starlight), and the advance of the perihelion of Mercury's

orbit, which are predicted to have half their observed values.

Dr. Schiff stressed that his theory is preliminary and is now being modified in the hope of improving its agreement with observations.

In its present form the theory is not Lorentz-invariant; it is being modified in order to make it Lorentz-invariant and improve agreement with observation.

Science News Letter, May 10, 1958

PHYSICS

Anti-Matter May Have Caused Siberian Crater

► THE SIBERIAN meteor crater carved from the earth in 1908 may have been caused by a chunk of anti-matter smashing into the earth's surface.

That is the suggestion a U. S. scientist makes in *Nature* (April 26). Dr. Philip J. Wyatt of Florida State University, Tallahassee, says a meteor composed of "contraterrene" matter would account for the lack of meteorite fragments near this and a few other meteor craters.

He proposes re-examination of the crater area in order to detect any radioisotopes, such as titanium-44, that might have been formed by the intense gamma radiation present at the time of impact.

When matter and anti-matter meet, each is annihilated and great energy released. So far, this process has been known to occur only with individual bits of matter, such as the annihilation of a proton and an anti-proton in the laboratory.

Science News Letter, May 10, 1958

● RADIO

Saturday, May 17, 1958, 1:30-1:45 p.m., EDT
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. Donald I. Patt, professor of biology, and acting chairman of the department of biology, Boston University College of Liberal Arts, Boston, will discuss "Biology of Growth."

MATHEMATICS

Gravitational Radiation Exists, Scientist Says

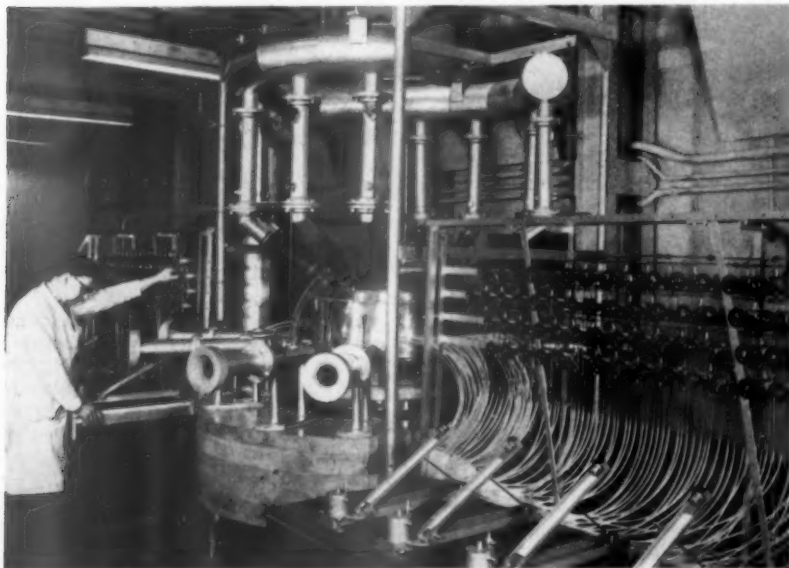
► GRAVITATIONAL radiation has a "real physical existence."

Dr. W. B. Bonnor of the department of mathematics, Queen Elizabeth College, London, England, has calculated its existence on the basis of the late Prof. Albert Einstein's general theory of relativity.

Dr. Bonnor reports he has found a way to show "quite clearly that gravitational waves have the properties" expected of radiation and that they "carry energy."

Gravitational radiation must be emitted in a wide class of particle motions, Dr. Bonnor concludes *Nature* (April 26).

Science News Letter, May 10, 1958



POWER FROM THE ATOM—Experiments in new laboratories and with new equipment are underway in England as part of their program for nuclear power plants. The photograph shows a model of apparatus for measuring the flow of gas used to transfer heat from the reactor furnace to the electricity plant.

SURGERY

Aorta Graft Technique Replaces Fabric, Plastic

► THE HUMAN trachea, or windpipe, may be used to replace sections of the aorta, the large blood vessel that carries renewed blood from the heart.

Studies on 23 long-time surviving dogs have demonstrated the merit of the technique. Dr. Edward H. Kopf of the Allied Hospital of the Sisters of Charity, Buffalo, N. Y., reported the results of the technique he developed to the Western New York Heart Association and the Section of Cardiology of the Ontario (Canada) Medical Association meeting in Rochester.

Dr. Kopf described the successful trachea grafts he and Dr. Charles E. Wiles, also of the Buffalo hospital, performed. Dr. Kopf said he was ready to try the technique on humans.

Replacement of blood vessels such as the aorta has long been a surgical problem. It is necessary in cases of hardening of the arteries, accidental damage to a blood vessel, and in an aneurysm, a swelling and threatened rupture in a weakened blood vessel.

Until now, surgeons have used fabric tubing or sections of aorta from dead persons.

The fabric tubing method usually results in great loss of blood, sometimes as much as 27 pints, while the new tissue grows around the graft. Human aortas are difficult to obtain. This, combined with the problem of storage until needed, makes them difficult to use.

Advantages of using the trachea include little or no blood loss, storage in formaldehyde for as long as eight months, and availability. In addition, the trachea is seldom diseased, as may be the case of a "used" aorta.

Removal of the trachea does not interfere with the closed circulation system needed for embalming, and undertakers are more willing to permit the trachea to be removed than the aorta.

Science News Letter, May 10, 1958

GENERAL SCIENCE

Science Fiction Presents Strange Picture of Science

► SCIENCE FICTION, which is read by 6,000,000 Americans, presents a far from accurate image of science and scientists.

This is the conclusion of Dr. Walter Hirsch, Purdue University sociologist, after analyzing the content of a representative sample of all the science fiction stories published between 1926 and 1950.

Furthermore, Dr. Hirsch found, the science fiction image of scientists has become less favorable through the years. In 1926, nearly half the "heroes" were scientists; in 1950 the figure had dropped to 24%. Meanwhile, there was no significant decrease in the proportion of scientists shown as villains.

Dr. Hirsch also found that science fiction no longer sees science as the savior of mankind. In 1926, nearly half the social problems written about in these stories were

solved by means of natural science and technology. By 1950, this figure had dropped to 26%.

Recent science fiction writing tends to "pass the buck" for the solution of problems to "aliens from other planets" in 28% of the cases.

Social scientists are not seen as problem-solvers to any significant extent, appearing in that role in only three percent of the cases in 1926 and two percent in recent writing.

Dr. Hirsch also discovered that science fiction through the years increasingly pictures research men tied up in "red tape." This fictional image may represent the real change that has taken place in the circumstances under which scientists work.

Dr. Hirsch's report on this study appears in *The American Journal of Sociology* (March).

Science News Letter, May 10, 1958

DENTISTRY

Tooth-Decay Inhibiting Agent Found in Saliva

► A CHEMICAL substance in human saliva that inhibits or destroys bacteria commonly associated with tooth decay has now been isolated.

The antibacterial factor is thought to be a chemical entity found in the saliva of "caries-immune" persons. These are adult men and women with no clinical evidence, past or present, of tooth decay.

Research findings indicate the substance is a protein, Dr. Gordon E. Green of the College of Dentistry at Ohio State University reported to the Society of American Bacteriologists meeting in Chicago.

The study, headed by Dr. Hamilton B. G. Robinson, associate dean of the College of Dentistry at Ohio State and supported by the Procter and Gamble Company, was launched to determine why approximately one in every 100 persons is resistant to tooth decay regardless of age, sex, dietary habit or oral hygiene.

The dental scientists compared the bacteria in the mouths of persons susceptible with those of persons immune to tooth decay.

The most striking difference in bacterial content was earlier found to be the significantly greater number of lactobacilli, an acid-forming organism, in the saliva of those susceptible to tooth decay.

These acid producers, long considered a cause of tooth decay, were much lower in number and sometimes non-existent in the saliva of decay-immune persons.

Culture studies and laboratory tests indicated some substance or mechanism exists in the saliva of decay-immune persons that could change the decay-producing potential of the lactobacilli by reducing their number and their ability to produce acid.

The scientists will now attempt to discover the source of this chemical substance that destroys or controls bacterial growth, and to determine the amounts found in the saliva of persons with varying amounts of tooth decay, Dr. Green concluded.

Science News Letter, May 10, 1958

IN SCIENCE

DENTISTRY

Strain of Modern Life Can Cause Tooth Damage

► THE TENSIONS of modern living can lead to severe damage to teeth, dental tissues and the jaw bone.

Since the beginning of time, the mouth has been closely linked to the emotional state, even in the animal world. Tacit recognition of this has been given for many years by such expressions as "grit his teeth in anger," "snarled at his adversary," "setting his teeth on edge," and similar idioms, Dr. Ernest R. Granger of Mount Vernon, N. Y., reports in the *Journal of the American Dental Association* (May).

Grinding and clenching of the teeth is associated with malocclusion or failure of the upper and lower teeth to meet properly. In addition, uneven pressures on the teeth cause irritation and breakdown of gum tissues. Eventually this leads to the loss of teeth.

Severe pain in the hinge-like joint called temporomandibular which connects the upper and lower jaws, is associated with the mechanics of upper and lower tooth contact, Dr. Granger says. The abnormal pressure applied to this joint by the person who is directly affected by daily stress results in damaged teeth, gums and jaw joints, he pointed out.

If the damage is severe and long standing, recovery may be a tedious and slow process unless the patient receives psychological help to relieve the troublesome stress.

Science News Letter, May 10, 1958

PEDIATRICS

Mother Carries Diarrhea To Newborn Infant

► ONE of the dread diseases of infants, diarrhea of the newborn, may be finding its way into the hospital environment by way of mothers of newborn infants.

A study of 300 mothers and their infants revealed that 44 mothers were harboring in their intestinal tracts one of the 11 types of organisms known to cause diarrhea in newborn babies. Three other mothers were carrying these organisms in their vaginal tracts.

Twenty babies of these mothers who were carriers acquired the same types of organisms in either their intestinal tracts or in their noses and throats.

Dr. Merlin L. Cooper of Children's Hospital Research Foundation and the Department of Pediatrics, College of Medicine, University of Cincinnati, presented the results of his study at a Chicago meeting of the Society of American Bacteriologists.

Science News Letter, May 10, 1958

CE FIELDS

GENERAL SCIENCE

Nobelists Ask Calling of Science Parliament

► BECAUSE THE political structure of the world needs to be adjusted to the progress of science, the National Academy of Sciences meeting in Washington, D. C., was asked to invite the Royal Society of London and the Academia Nauk of the USSR, equivalent British and Russian bodies, to establish a scientific world parliament.

Presented by two Nobelists, Dr. Albert Szent-Gyorgyi of Woods Hole, Mass., and Dr. Linus Pauling of Pasadena, Calif., the proposal recited that scientific discoveries have changed the nature of the world and contributed greatly to the use of natural resources for the benefit of man, but that these have resulted in forces of destruction that hold the world in terror.

The hope was expressed that a scientific world parliament would lead to recommendations that would assist nations in attacking and solving the great problems that must now be faced.

Science News Letter, May 10, 1958

PSYCHOLOGY

Additive Helps Aged, Mental Patients

► DAILY FEEDINGS of a special form of the food element, glutamic acid, has enabled elderly, deteriorated psychotic persons to emerge from the "back wards."

Some were actually discharged and went for care to ordinary nursing homes; others were so greatly improved that they began to dress themselves, feed themselves and even to clean their quarters.

The form of glutamic acid used was L-Glutavite which is a chemical relative of the flavor-sharpening monosodium glutamate, familiar in the kitchen under various trade names. It was tried in an experiment at the Veterans Administration Hospital, Bedford, Mass., by Drs. Louis P. Finkle and L. J. Reyna.

The patients treated in the experiment were a group who were unresponsive to the modern tranquilizing drugs and for whom the tranquilizers were dangerous due to their serious side effects.

"In marked contrast to the frequently seen undesirable tranquilizer effects such as apathy, diminished psychomotor activity, drowsiness, and sluggish, aimless, stiff-like appearance and gait, often characterized as 'acting like zombies,' the L-Glutavite group were alert, active, more interested in their environment and social activities," the experimenters report.

The elderly patients were given tomato juice three times a day, seven days a week

for one year. During the first and third quarters all the patients got plain tomato juice. During the second and fourth quarters, some were given L-Glutavite in their tomato juice. Neither the patients, nor the doctors, nurses or aides, knew which patients were treated and which had plain juice.

Of the treated patients, 73% showed improvement while only 20% of the untreated controls seemed better.

Results of the experiment are reported in the *Journal of Clinical and Experimental Psychopathology*.

Science News Letter, May 10, 1958

ENGINEERING

Sputnik Launchings Based on Sound Methods

► THE LAUNCHINGS of Russian sputniks were based on a sound and expanding program of precision measurement, Dr. Allen V. Astin, director of the National Bureau of Standards, Washington, has concluded.

In comparing the relative progress of the United States and Russia in making accurate measurements of everything from electricity to nuclear radiation, Dr. Astin found one field where the Soviet's achievement level is "quite startling." Scientists at the Russian equivalent of the Bureau of Standards could make calibrations of temperature-measuring devices up to 6,000 degrees centigrade, about 10,800 degrees Fahrenheit.

In comparison, Dr. Astin said, his Bureau provided temperature calibrations up to about 5,000 degrees Fahrenheit.

Few persons realize the "dependence of technological progress upon advances in measurement techniques," Dr. Astin said. The Russians have a tremendous "crash" program underway to pull ahead of the U. S. in this field.

By 1960, for instance, they are planning to triple production of all types of electrical, mechanical, optical and radiation measuring instruments, as well as devices for automation.

This is part of their program to reach a competitive industrial position with the U. S.

Soviet instrument development is under a Committee on Standards, Measures and Measurement Apparatus of the Council of Ministers of the U.S.S.R. Five research institutions work directly for this Committee on new and improved techniques for making measurements and on developing basic standards.

A network of regional calibration centers is supervised by the five institutions. The centers have the responsibility of taking the latest findings in measurement research and imposing precision production on machine-producing plants.

Dr. Astin urged that research activities at the National Bureau of Standards be "substantially strengthened" in order to meet the Soviet challenge.

Science News Letter, May 10, 1958

ORNITHOLOGY

Penguin's Nose Helps Eliminate Excess Salt

► THE PENGUIN and other marine birds seem to have an excellent built-in de-salting device, two scientists report in *Nature* (April 26).

Sea birds, in contrast to land birds, have particularly well-developed nasal glands. These had been thought to protect the sensitive lining of the nasal cavity from the irritating effects of sea water. Now evidence points to the glands as very efficient removers of excess salt.

Dr. Knut Schmidt-Nielsen, department of zoology, Duke University, and Dr. W. J. L. Sladen, department of pathobiology, Johns Hopkins School of Hygiene and Public Health, experimented with a Humboldt penguin given five grams, about one-fifth of an ounce, of salt embedded in some fish.

Ten minutes after feeding, the scientists report, a salty nasal secretion began that lasted for more than 11 hours. By collecting the clear, colorless liquid and measuring its salt concentration, they found approximately two-thirds of the salt fed to the bird had been eliminated through the nose in only four hours.

In contrast, the kidney accounted for "perhaps one-tenth" the amount of sodium and chloride excreted by the nasal salt glands.

Since the penguin can eliminate salts from its nose at a concentration well above that of sea water, it achieves a net gain in "drinkable" water. This, Drs. Schmidt-Nielsen and Sladen speculate, may be the significance of marine birds' special extra-renal salt excretion.

Science News Letter, May 10, 1958

PHYSIOLOGY

Ten Pounds Overweight Shortens Life 50 Days

► BEING TEN pounds overweight will decrease life expectancy by 50 days, Dr. Linus Pauling, California Institute of Technology Nobelist in chemistry, has found after statistical studies inspired by the controversy over the effect of atomic bomb fallout.

To the National Academy of Sciences, Dr. Pauling, protagonist for the stopping of atomic bomb tests, commented that Drs. Edward Teller and Albert L. Latter, atomic scientists who favor continuation of the tests, had estimated that radiation from fallout was shortening human life as much as one ounce of overweight.

This started Dr. Pauling making a statistical analysis of the relation between longevity and body weight, and he found that longevity decrease in relation to obesity can be expressed by a single term involving the square of the amount of obesity.

He concluded the Teller-estimate was, incidentally, wrong by a factor of more than a thousand, and that previous estimates that ten pounds overweight cost a year of life expectancy are too pessimistic.

Science News Letter, May 10, 1958

GENETICS

Russian Genetics and Chickens

Russian genetics lag behind Western research. One experiment being undertaken by Soviet geneticists demonstrates chicken feathers turn color through blood transfusions.

By HOWARD SIMONS

► THERE IS ONE field of scientific study in which most Western researchers, and even a few Russian researchers, agree that the Soviet Union is not ahead of the United States in its achievements. This is biology, particularly genetics.

Dr. Bentley Glass of Johns Hopkins University once gave a talk in which he credited the Russian scientist Karpechenko with having produced the first, man-made species of plant. Karpechenko, Dr. Glass explained, crossed the cabbage with the radish. The first hybrid was completely sterile. The Russian continued his experiments and finally produced a completely fertile form that he named "Raphanobrassica," a scientific name which might be rendered in common language as "rabbage." The new plant species, Dr. Glass said, was agriculturally "worthless." It combined the prickly, inedible leaves of the radish with the miserable root system of the cabbage.

More Rabbage

Contemporary Russian genetics, from the point of view of the vast majority of Western observers, is, in many respects, like Karpechenko's rabbage. It, too, although found in some fertile forms, is for the most part, considered worthless. And, it tends to combine the "prickly, inedible leaves" of Lysenko's theories with the "miserable root system" of Communism.

No other Russian science has received so much publicity for so long a time as has Russian genetics. Nor has any other Russian science been subjected to as much ideological and political pressure as has Russian genetics.

Trofim Lysenko, the "prophet" of Marxist genetics, is, to this day, both a fact and a factor in Russian genetics. It is even possible that he is a more important figure under Khrushchev than he was under Stalin. Both are the sons of peasants. Both are Ukrainians. But of more importance than their kindred beginnings, Lysenko's theories lend themselves very well to Khrushchev's latest crop-rattlings.

Lysenko's work in trying to transform spring varieties of wheat into winter varieties and raising the butter-fat content in dairy cattle, both being experimented with along his prescribed lines of Michurinist-adopted genetics, carry a bigger premium today than they did a decade ago when he was climbing toward his summit. Success with his experiments would enhance Khrushchev's agricultural program at home, and add valuable fuel to the Cold War

agricultural fire the Russian dictator lighted recently.

This is not to say that Lysenko is as omnipotent and as infallible today as he was under Stalin. Despite Khrushchev's blessings, given to Lysenko as recently as December 1957, a group of Russian "classical" geneticists does exist in the Soviet Union. That they may be in a power struggle with Lysenko and his followers seems likely. A possible "straw in the wind," as one American geneticist has termed it, popped up following the now famous Pugwash Conference in the form of a statement by a group of Soviet scientists concerning the question of prohibition of atomic weapons and of their tests. It was signed by 196 Russian scientists, including A. Nesmeyanow, president of the Soviet Academy of Sciences, Peter Kapitza, Nobelist N. Semenov and others of the Red scientific hierarchy. Included, too, were several "classical" geneticists. Conspicuously missing were the signatures of Lysenko and company. Which group will win this genetics power struggle, like other power struggles in contemporary Russia, is anyone's guess.

The greenhouse in which Lysenko's hybrid science is being nurtured, experimented with and brought to fruition is a small,

squat gray building, about a half-hour's drive from Red Square. It sits in the middle of a peasant village that only recently has been swallowed by greater Moscow. It is the Moscow Institute of Genetics, headed by the same Trofim Dennissovitch Lysenko.

On the day I visited the Institute, Dr. Lysenko was "still vacationing in Solchi." I was met at the entrance to the Institute—that faces a field of 100% Russian hybrid corn, and which, like the Institute, is free of Western influence—by a smiling man in a double-breasted blue serge suit.

Lysenko's Assistant

He introduced himself as Dr. N. F. Kushner, professor of animal genetics and director of the Institute's poultry breeding program. After the exchange of a few pleasantries I asked Dr. Kushner about Lysenko. Of his boss, colleague and friend, he had this to say:

"Lysenko's principal point of view about heredity is still the predominant view held by the great majority of Russian biologists. It is still the point of view being taught in our schools. But, as in other countries, we have many theories and are continually discussing other points of view."

Dr. Kushner, who had exchanged some of these views with other geneticists throughout the world at an international meeting held in Japan in 1956, made it clear that he is a firm and devoted believer in both Lysenko the man and Lysenko the scientist.

"News about the fact that Lysenko



CHICKEN CHANGE — Russian laboratory assistants show off chickens whose feathers underwent a change in color after blood transfusions. The experiments are being conducted by a Soviet geneticist at the Moscow Institute of Genetics, headed by Trofim Lysenko.

stepped down as president of the Academy [In April 1956 Lysenko asked to be relieved of his duties as president of the All-Union Lenin Academy of Agricultural Science.] had a bad effect on the scientists in Japan and other countries," Dr. Kushner said.

"But to assign to this event anything more than the simple fact that he wanted to return to the laboratory and his scientific studies, was, and is, a grave mistake. He is still a highly respected scientist in the Soviet Union. He is still director of this Institute, a member of the presidium of the Soviet Academy of Sciences, a deputy of the Supreme Soviet of the U.S.S.R., and a member of the commission granting higher degrees to university graduates.

"It is well known that Lysenko is a good scientist, but a poor administrator of science."

Current Research

At this point in the interview, I asked Dr. Kushner if he could describe a current experiment that follows the lines of Lysenko's genetics.

"But of course," he answered traditionally, "we are presently working with chickens and blood transfusions. Blood is taken from purebred red New Hampshires and transfused into purebred White Leghorn pullets ranging in age from three to four months. Twice weekly for five months, each of the Leghorns receives 150 cubic centimeters of the New Hampshire blood."

The treated hens are then crossed to pure White Leghorn cocks and the eggs incubated and hatched. What results, Dr. Kushner explained with satisfaction, are chicks with a definite and noticeable change in plumage. Fifteen to 20% of the first generation appear with anywhere from one to 50 grayish feathers. In the succeeding generations, there is an increase in the number of offspring and the number of feathers with a marked pigmentation change. The percentages are far smaller for the controls that did not receive transfusions, Dr. Kushner said.

"New" Chickens

Here, the good Russian scientist stopped and made a hurried telephone call, and in a few minutes two women assistants dressed in white laboratory smocks and surgeon-like skull-caps arrived carrying both living and dead examples of the experiment.

"They look like Plymouth Rocks," he exclaimed, and I had to agree. The embryos and preserved chicks were left as Exhibit A, but the clucking Exhibit B's were taken away by his assistants.

(Recently Dr. Jacques Benoit and his associates in France reported to the French Academy of Sciences that they had succeeded in changing the hereditary characteristics of ducks by injecting them with a sex gland extract from another type of duck. Although most Western scientists remain skeptical, a few believe these experiments, as well as those by the Russians, will cause a revolution in classical genetics.)

When the assistants left I turned to Dr. Kushner and asked him if one could carry the results of his experimentation a bit further and apply it to humans. Could

one, I asked, transfuse the blood of a man with one color of skin to that of another with a different color of skin and get a pigmentation change in the offspring?

"I cannot answer your question directly," Dr. Kushner said, "because I have had no first-hand experience with this type of experimentation. But, I think someone in your country has.

"When I was a doctor serving with the Red Army on the German front during the Great War, I heard many stories of how your soldiers refused blood transfusions if they knew the blood had come from a black man. I think these soldiers must have had some knowledge of a scientific study carried on in your country that showed the color of a man's skin can be affected by blood transfusions."

My explanations were that what Dr. Kushner had probably heard were cases of deep-seated racial prejudice, and that most, if not all, the scientific evidence on the subject points in the opposite direction, and the added fact that the donor's skin color does not appear on bottles of blood. They were met with a shrug.

Science News Letter, May 10, 1958

MEDICINE

Mother's Polio Shots Protect Unborn Baby

► WOMEN who receive polio shots during pregnancy not only protect themselves but provide the unborn infant protection that lasts as long as three months after birth.

Studies of 142 mothers-to-be showed the benefits of Salk shots were passed on to the infants, Dr. Gordon C. Brown of the University of Michigan School of Public Health reported to the Society of American Bacteriologists meeting in Chicago.

Although doctors have long suspected that polio vaccine might have carry-over value for infants, Dr. Brown's study provided the first laboratory confirmation of this belief.

Dr. Brown found the higher the level of protection given the mother, the longer the protection lasted for the infant. Also, vaccinated mothers gave their children protection of the same potency and duration as those mothers who acquired a similar level of immunity through natural exposure to the disease.

However, the polio protection given infants by their mothers diminished as the babies grew older.

The research indicates parents can now insure continuous protection against polio for their children from the moment of birth. Dr. Brown urged prospective mothers to complete the series of three shots and start vaccinations for infants at age three months.

Dr. Catherine J. Carroll, also of the University, assisted in the research, which was supported by the National Foundation for Infantile Paralysis.

Science News Letter, May 10, 1958

A device to count and measure fog particles makes it possible for one man to measure and record, with one hand, at an average rate of 3,300 particles per hour.

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AIRPLANE DESIGN MANUAL—Frederick K. Teichmann—*Pitman*, 4th ed., 489 p., illus., \$8.50. Growing out of notes for airplane design courses at New York University.

COLLEGE MATHEMATICS—Kaj L. Nielsen—*Barnes & Noble*, College Outline Series, 302 p., paper, \$1.95. To aid the student in obtaining a birdseye view of college mathematics or to give him a rapid review. Keyed for use with standard textbooks.

COLOR TV: Principles and Practices—*General Electric*, 134 p., illus., paper, \$5. Text for a course on color television and a technical manual for dealers.

COMMON WILD ANIMALS AND THEIR YOUNG—Rita Vandivert—*Dell*, 128 p., illus. with photographs by William Vandivert and drawings by Carl Burger, paper, 50¢. A charming book.

COMPARISON OF THE LARGE-SCALE STRUCTURE OF THE GALACTIC SYSTEM WITH THAT OF OTHER STELLAR SYSTEMS—N. G. Roman, Ed.—*Cambridge Univ. Press*, 73 p., illus., \$3. Discussions at a symposium dealing with the spiral structure of galaxies, with the radio "coronas" found around the galactic system and around

some of the nearer galaxies and the distribution of supergiant stars.

A COMPREHENSIVE DICTIONARY OF PSYCHOLOGICAL AND PSYCHOANALYTICAL TERMS: A Guide to Usage—Horace B. English and Ava Champney English—*Longmans*, 594 p., illus., \$10.75. For students and others who need to know the precise meaning of terms in present use.

CONDUCTANCE CURVE DESIGN MANUAL—Keats A. Pullen, Jr.—*Rider*, 114 p., curves, paper, \$4.25. For engineers and designers.

THE DYNAMICS OF PLANNED CHANGE: A Comparative Study of Principles and Techniques—Ronald Lippitt, Jeanne Watson and Bruce Westley—*Harcourt*, 312 p., \$6. Putting a Sputnik into orbit overhead or a decision of the Supreme Court may catapult us into a far-reaching social change. This work discusses what psychologists have found out about our ability to change with the changing world.

EMPEROR PENGUINS—Jean Ruyolier, translated by Peter Wiles—*Speller*, 131 p., illus., \$3.75. The author was medical officer of a French party that wintered at a remote coastal area of Adeline Land to study the Emperor Penguins.

EMPLOYMENT OUTLOOK IN THE BIOLOGICAL SCIENCES—*Govt. Printing Office*, U. S. Dept. of Labor Bulletin No. 1215-5, 9 p., illus., paper, 15¢. Reprint of a chapter in the 1957 edition of the Occupational Outlook Handbook.

EMPLOYMENT OUTLOOK IN THE PHYSICAL AND EARTH SCIENCES—*Govt. Printing Office*, U. S. Dept. of Labor Bulletin No. 1215-4, 20 p., illus., paper, 20¢. A reprint of a chapter in the 1957 edition of the Occupational Outlook Handbook.

FREE TIME: Challenge to Later Maturity—Wilma Donahue, Woodrow W. Hunter, Dorothy H. Coons and Helen K. Maurice, Eds.—*Univ. of Mich. Press*, 172 p., \$4.50. Pointing to the need to discover the value of leisure and the use of non-working time for creativity.

FROM APE TO ANGEL: An Informal History of Social Anthropology—H. R. Hays—*Knopf*, 455 p., illus. with photographs and drawings by Sue Allen, \$7.50. A novelist describes the fascinating variety of customs in many parts of the world and introduces the scientists who have gathered the data.

GENERAL ZOOLOGY—Gairdner B. Moment—*Houghton*, 632 p., illus., \$7.50. A most attractive textbook.

GENETICS AND THE RACES OF MAN—William C. Boyd—*Boston Univ. Press*, 20 p., paper, 50¢. A lecture given at Boston University in December, 1957.



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HISTORY OF DENTAL LABORATORIES: And Their Contributions to Dentistry—Robert J. Rothstein—*Lippincott*, 277 p., illus., \$7.50. There is hardly a person in the civilized areas of the world who does not require dental prosthetics at some time and so the work of the dental laboratory is important if not glamorous.

INTRODUCTION TO ATOMIC AND NUCLEAR PHYSICS—Rogers D. Rusk—*Appleton*, 482 p., illus., \$7.50. For the first year course in general physics and requiring not more than average mathematical training.

LIFE HISTORIES OF NORTH AMERICAN BLACK-BIRDS, ORIOLES, TANAGERS, AND ALLIES—Arthur Cleveland Bent—*Govt. Printing Office*, Smithsonian, U. S. National Museum Bulletin 211, 549 p., illus., paper, \$2.25.

THE LOVE-LIFE OF ANIMALS—Wolfgang von Buddenbrock, translated from the German by J. M. Chaplin—*Crowell*, 207 p., illus., \$4.50. Description of the principles of courtship and mating in insects, birds and vertebrates with a chapter on the care of the young.

MENTAL GROWTH AND PERSONALITY DEVELOPMENT: A LONGITUDINAL STUDY—Lester W. Sontag, Charles T. Baker and Virginia L. Nelson—*Child Development Publications*, 143 p., graphs, \$3. Reporting a study intended to search out the factors in early childhood that lead to intellectual growth during the school years.

NONMETALLIC FERROMAGNETIC MATERIALS AND DEVICES—John M. Blank and others—*Wright Air Development Center (Office of Technical Services)*, 134 p., illus., paper, \$3.75. Reporting work done by the Electronics Laboratory of General Electric.

NUCLEAR RADIATION DETECTION—William J. Price—*McGraw-Hill*, 382 p., illus., \$9. Gathering together the basic information on all important nuclear-radiation detectors in use today.

ONE LANGUAGE FOR THE WORLD—Mario Pei Devin-Adair, 294 p., \$5. An illuminating review of the 3,000 natural languages in use and the 600 international languages proposed, with the suggestion that the nations of the world agree by fiat on an international language. (SCIENCE SERVICE in demonstrating through use for abstracts in medical journals and conferences the usefulness of Interlingua as an auxiliary language has taken the attitude that such language should win its way through use rather than by legal adoption.)

ORTHOPSYCHIATRY AND THE SCHOOL—Morris Krugman, Ed.—*Am. Orthopsychiatric Assn.*, 265 p., \$4. To help the educator build mental health in children.

THE PARENTS' GUIDE TO EVERYDAY PROBLEMS OF BOYS AND GIRLS: Helping Your Child from Five to Twelve—Sidonie Matsner Gruenberg—*Random House*, 363 p., graphs, \$4.95. Practical counsel for parents.

PHOTOSENSITORS: A Treatise on Photo-Electric Devices and Their Application to Industry—W. Summer—*Macmillan*, 675 p., illus., \$21. There is hardly any other device so universally applicable as the photosensitizer. Intended as an inventory of present practice.

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261 p., illus., \$7.50. In this text, the author states, there are more words, drawings, curves and tables per idea than ordinarily found in technical treatises. This, he believes, facilitates learning.

PRINCIPLES OF PHYSICAL CHEMISTRY—Samuel H. Maron and Carl F. Prutton—Macmillan, 3d ed., 789 p., illus., \$8.50. Text for a full year course for students of chemistry and chemical engineering.

PRINCIPLES OF RESEARCH IN BIOLOGY AND MEDICINE—Dwight J. Ingle—Lippincott, 123 p., illus., \$4.75. With the "aid of Lewis Carroll and the immortal Alice," the author has emphasized the foibles of the scientist and the difficulties to be recognized in the laboratory and the restrictions to be placed upon ideas.

THE PRINCIPLES OF SEMANTICS—Stephen Ullman—Philosophical Lib., 2d ed., 346 p., \$10. On the theory of meaning in language.

RUSSIAN-ENGLISH GLOSSARY OF AERONAUTICAL AND MISCELLANEOUS TECHNICAL TERMS—Office of Technical Services, paper, \$7.

SCIENCE IN DAILY LIFE—Francis D. Curtis and George Greisen Mallinson—Ginn, new ed., 580 p., illus., \$4.48. A high-school text on general science intended to train the pupils to think.

SOCIAL CLASS AND MENTAL ILLNESS: A Community Study—August B. Hollingshead and Fredrick C. Redlich—Wiley, 442 p., graphs, \$7.50. Report of a research program that revealed that in a community each social class exhibits definite types of mental illness and that each class reacts to mental illness in its members in different ways.

SPACEPOWER: What It Means to You—Donald Cox and Michael Stoiko—Winston, 262 p., illus., \$4.50. Dealing mostly with the social and political aspects of space control.

SUGAR: From Scarcity to Surplus—Hubert Edson, foreword by Pieter Honig, arranged by Alfred E. Lewis—Chemical Pub. Co., 224 p., illus., \$5. Describing technical changes that have taken place in the sugar industry in the past 70 years.

TEACHING SCIENCE TO THE ORDINARY PUPIL—K. Laybourn and C. H. Bailey—Philosophical Lib., 415 p., illus., \$10. Although much emphasis has been placed recently on assuring brilliant students a chance to learn science if they are interested, the great majority of students who are just "ordinary" should not be neglected.

USA NATIONAL COMMITTEE OF THE INTERNATIONAL SCIENTIFIC RADIO UNION REPORT TO THE NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL—Nat. Acad. of Sciences—Nat. Res. Council, 195 p., paper, \$2.50.

VIRGINIA MINERALS AND ROCKS—R. V. Dietrich—Virginia Polytechnic Inst., 2d ed., Bulletin Engineering Experiment Series No. 122, 57 p., illus., paper, \$1. For the hobbyist rock collector.

YOUR ALLERGY AND YOU: A Handbook of Do's and Don'ts for the Allergy Sufferer—Kay Kempton Haydock, introduction by Horace S. Baldwin—Holt, 242 p., \$2.95. Answers given by authorities to questions raised by the author as a patient.

Science News Letter, May 10, 1958

Complete archives of *bird songs* are to be kept by the Hungarian Institute of Ornithology as an extension of its large collection of bird specimens.

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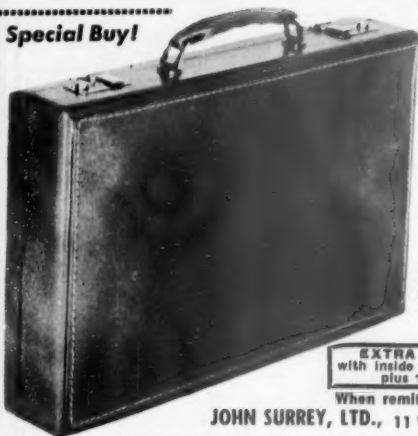


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Questions

ENGINEERING—How long-lasting are mercury-vapor lamps compared with incandescent lamps? p. 292.

GEOPHYSICS—How could the temperature inside a man-carrying satellite be controlled? p. 291.

MEDICINE—How long will an infant be protected from polio if its mother received polio vaccine during pregnancy? p. 299.

PHYSICS—What two experiments are not, so far, successfully predicted by the new neutrino theory of the forces of gravitation? p. 295.

PHYSIOLOGY—What is the scientific name for color-blind persons who confuse red and green? p. 293.

Photographs: Cover, pp. 291 and 293, Fremont Davis; p. 295, British Information Services, Inc.; p. 298, Howard Simons; p. 304, Eastman Chemical Products, Inc.

ENTOMOLOGY**Praying Mantis Lays Eggs For Early Summer Hatch****See Front Cover**

► **INSECTS** OF the mantis group receive their name because of the strange "praying" position they assume.

With its jointed arms bent and held outward in a characteristic devotional attitude and its head raised upon a long and erect "neck" or prothorax, the mantis does appear to be praying.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows one species in another characteristic pose, laying a mass of eggs. The young are hatched in early summer. The species is *Tenodera aridifolia sinensis* Saussure.

Science News Letter, May 10, 1958

Do You Know?

The Atomic Energy Commission has operated reactors at its several installations for a total of over 100 reactor years without a single fatality or even injury to operating personnel.

Moraines of rock and other fill deposited by glaciers in the Antarctic are 10,000 years old, compared with hundreds of years for some European and North American moraines.

Searchers have found individual blight-free *chestnut trees* in 36 states; they hope graftings will produce a new disease-free variety.

Gravity measurements are used to determine the shape of the earth, the true direction of the earth's center, and density of the material of the topmost layers.

Kodak reports on:

the things some people want in front of a television camera tube... slush-molding and the insidious sun... creation and propagation of slides and filmstrips



It will be interesting to see if this picture and the paragraph of type you are now reading succeed in their purpose (and it's a long, long shot) of eliciting even a single letter, wire, or phone call from a party seeking a strong and competent organization to take on the development, design, and/or construction of a complex optical-mechanical system for feeding some sort of image into a television camera tube. The quest for such a contact is suggested by the very satisfactory manner in which our work is progressing on two such projects, the first television bombsight and the first airborne television gunsight. In security-dictated disorder, the photograph suggests the kind of components we make and put together for these affairs. Nor are our talents along these lines newly acquired, even if Ed Sullivan* doesn't stress them on Sunday evenings when discussing our more popular mechanical and optical products. The letter, wire, or phone call should go to Eastman Kodak Company, Military and Special Products Division, Rochester 4, N. Y.

*The fact may little signify, but Ed and most of the other figures of live television reach the magic screen through Kodak Television Ektanon Lenses on the studio cameras.

What's a polyethylene, Pop?

The pentasyllable "polyethylene" is now tossed around by fifth-graders. The public knows that polyethylene is polyethylene. To impart some complexity to the subject, we give you two new polyethylenes.

- *Epolene C polyethylene* at 300°F, exhibits 8000 cps viscosity. Addition of 25% paraffin, with which it is completely compatible, drops the viscosity at this temperature to only 1300 cps. Being polyethylene, it has strength, flexibility at low temperature, resistance to water and water vapor, inertness to chemical activity. The low viscosity permits secure bonding to paper with conventional roll-coating equipment modified to operate at slightly higher temperature instead of a complicated extrusion-lamination process. You can also make shells out of *Epolene C* by pouring

it into a cooled mold and pouring out the excess that hasn't cooled enough to solidify. Toy manufacturers call this slush-molding. Toy manufacturers are a smart lot.

- The other new one is *Tenite Polyethylene* fortified against the unfortunate tendency of ultraviolet radiation to take the edge off some of its virtues. We have found an effective inhibitor and a way of incorporating it. Now, to the advantage of polyethylene in agricultural and horticultural applications, its life in the sun can be at least double for sheeting and quadrupled for molded objects. The outdoor formulation even comes in a good choice of colors.

All reasonable questions about polyethylene, either *Epolene C* or inhibited *Tenite Polyethylene*, will be answered by Eastman Chemical Products, Inc., Kingsport, Tenn. (Subsidiary of Eastman Kodak Company).

The powers of semi-darkness

One result of all the efficiency pervading life today has been more time to sit around in semi-darkness listening to speakers draw attention to Worthwhile Matters with the help of slides or filmstrips. You will not deny that this is good.

What, then, can be done to encourage and facilitate the generation of lots more slides and filmstrips? Consider the sources.

There are organizations—some for profit, some non-profit—that produce them for schools. All they need for encouragement is sales. Subjects are of the kind that keep well. Life along the Nile. The circulation of the atmosphere. That sort of thing.

Then there are firms producing films and filmstrips to order for promoters of causes. The need for higher protective tariffs. The need for lower barriers to international trade. How to sell bicycles to people over 40. Here an advertising or public relations agency often acts as intermediary between sponsor and producer.

Outfits that use slides and filmstrips to communicate on a broad and varied scale often maintain their own production facilities for the purpose. This would include large companies, government bureaus, ag colleges.

Not to be neglected beyond these large operations, however, is the individual on his own who has an audience to face and to tell of his work and thoughts as vividly as he can. He, too, can make them—slides if he intends to put on the same performance only once or a few times, filmstrips if it is to be given many times in essentially unchanged form.

For his benefit we have published a *Kodak Data Book*, "Photographic Production of Slides and Filmstrips." Kodak dealers have it for sale or can order it. It is particularly rich in details on attaining good quality color reproduction by the use of masking techniques. The danger that purchase of this 50¢ booklet turns out eventually to have been the first step toward establishment of a slide-and-filmstrip department in the organization with which the reader is affiliated, while slight, is undeniably present.

Price quoted is subject to change without notice.

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science

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✿ **ALUMINUM DOCKS** for lakeside can be put together in eight-foot sections. Succeeding sections are fastened by means of a pin and slot arrangement and each is adjustable to water depth. Designed to withstand winds up to 50 miles per hour, the dock will not rust, rot, sag, or warp.

Science News Letter, May 10, 1958

✿ **SWIMMING AID** is a sled made of plastic designed to help develop and to teach youngsters the flutter kick. It will support adults up to 175 pounds in weight, too. The swimmer's sled is rust-, rot- and warp-proof.

Science News Letter, May 10, 1958

✿ **IRON HOLDER** designed to permit burn-free ironing for the housewife is made of aluminum. It consists of a clamp-on bracket and support arm. The device holds either closed- or open-handled hot irons off the ironing board.

Science News Letter, May 10, 1958

✿ **BAIT KEEPER** is an aerator housed in a portable butyrate plastic case. The aerator, shown in the photograph, uses a miniature piston pump to force a steady supply of air into any bait bucket or jar. The plastic-



housed aerator eliminates the need for lowering a bucket over the side of a boat. Used only 15 minutes every hour, the aerator is powered by a six-volt battery.

Science News Letter, May 10, 1958

✿ **FOOTBALL PLAYER IDENTIFIER** permits anyone to spot a player at a glance.

The spotter contains spools carrying the names of players for each of the 22 positions, as well as another spool for the downs. When a substitution is made, the spool is wound around to the new name.

Science News Letter, May 10, 1958

✿ **RECTANGULAR LAUNDRY BASKET** is made of a polyethylene plastic. With a capacity of more than a bushel, the basket is said to fit laundry carts and clothing folds. The plastic basket also does not need a liner.

Science News Letter, May 10, 1958

✿ **AUTOMATIC GOLF SCORER** fits around wrist like a wrist watch. Imported from Switzerland, the golf scorer is housed in a metal case and is faced with a magnifying glass to enlarge the numbers.

Science News Letter, May 10, 1958

✿ **DO-IT-YOURSELF GREENHOUSE** for the hobby horticulturist eliminates the need for permanent foundations or masonry walls. Metal parts designed for self-assembly are made of aluminum. All-glass sides double the inside growing area, and heating, cooling and ventilating systems are built in.

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Nature Ramblings



By HORACE LOFTIN

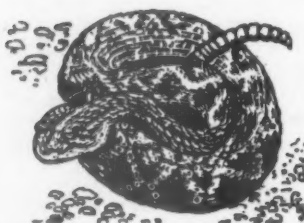
► IN AN automatic reaction to a long winter of being penned in steam-heated houses and offices, America is taking to the out-of-doors as spring marches northward over the country. Along with the humans, many poisonous snakes are rousing themselves from winter lethargy or sleep to seek the springtime sun.

The two will meet a comparatively small number of times. An infinitesimal proportion of these meetings will result in a man, woman or child being bitten by a venomous snake.

What are the chances of an individual being bitten in the United States? According to one estimate, there's a better statistical chance of his being struck by lightning.

Another reassuring statistic is that more Americans are killed or injured each year in their bathtubs than by snake bite. (An eminent herpetologist adds that "it must

Snakes and Snake Bites



be admitted that a good many more people encounter bathtubs than snakes and, it is hoped, more often")

Some 1,500 persons are bitten each year by poisonous snakes in this country. Approximately 1,000 of these are rattlesnake bites, and these probably account for a disproportionately high percentage of snake bite fatalities among humans.

Of the approximately 1,500,000 deaths occurring annually in the United States, 30 are due to poisoning by rattlesnake bite. This amounts to only about three percent of the persons bitten. It is estimated that the number of fatalities due to rattlesnakes probably never exceeded 15% to 20% of the number of persons bitten, even when snake bite treatment was most primitive.

The moral of this story is, be reasonably careful but do not worry a great deal about venomous snakes while you are out-of-doors. Certainly never handle live or supposedly "dead" poisonous snakes. If you are in an area noted for snakes, certainly you should wear boots or similar leg protection. Always have a snake bite kit handy.

In summing up, a rule of snake safety is "watch where you put your hands and feet; do not put them in places without looking and do not put them in places where you cannot look."

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